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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/826,813  | 04/15/2004  | Nobuo Kanou          | 2102475-991151      | 1572             |
| 26379   | 7590        | 11/15/2004           | EXAMINER            |                  |
| GRAY CARY WARE & FREIDENRICH LLP<br>2000 UNIVERSITY AVENUE<br>E. PALO ALTO, CA 94303-2248 |             |                      |                     | NGUYEN, LONG T   |
|   |             | ART UNIT             |                     | PAPER NUMBER     |
|   |             | 2816                 |                     |                  |

DATE MAILED: 11/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b> |
|------------------------------|------------------------|---------------------|
|                              | 10/826,813             | KANOU ET AL.        |
| Examiner                     | Art Unit               |                     |
| Long Nguyen                  | 2816                   |                     |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1)  Responsive to communication(s) filed on 15 April 2004.

2a)  This action is FINAL.                            2b)  This action is non-final.

3)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

4)  Claim(s) 7-12 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5)  Claim(s) \_\_\_\_\_ is/are allowed.

6)  Claim(s) 7-12 is/are rejected.

7)  Claim(s) \_\_\_\_\_ is/are objected to.

8)  Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

9)  The specification is objected to by the Examiner.

10)  The drawing(s) filed on 15 April 2004 is/are: a)  accepted or b)  objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)  The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a)  All    b)  Some \* c)  None of:  
1.  Certified copies of the priority documents have been received.  
2.  Certified copies of the priority documents have been received in Application No. 09/952,639.  
3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1)  Notice of References Cited (PTO-892)  
2)  Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3)  Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 4/15/04.

4)  Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.

5)  Notice of Informal Patent Application (PTO-152)  
6)  Other: \_\_\_\_\_

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to because there are minor informalities in the drawings. In particular, it is not clear why circuit blocks 1E and 4 in Figure 4 are labeled "Current Comparison Circuit" because the inputs of these circuits are receiving input voltages. Note that the specification describe that circuits 1E and 4 in Figure 4 are voltage comparison circuits, Thus, it appears that circuit blocks 4 and 1E in Figure 4 should be labeled as --Voltage Comparison Circuit--.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Specification***

2. The disclosure is objected to because there are numerous informalities throughout the specification. For example, "current conversion circuit" on lines 15, 16 and 19 of page 19, and on lines 9, 10 of page 20 should be changed to --voltage conversion circuit-- because the inputs of these circuits are receiving voltages, and the drawings also labeled them as voltage conversion circuits. Also, "ID" on line 25 of page 20 should be changed to --1D--. Thus, applicant is requested to review the entire specification and correct any further errors of which applicant may become aware in the specification.

3. The specification is also objected to as failing to provide proper antecedent basis for the claimed subject matter of claim 12. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required. Note that Figure 16 shows a circuit that includes a plurality of variable amplifiers connected in series, and the specification only discloses that the exponential conversion circuit shown in Figure 11 is used in Figure 16. However, independent claim 7 does not read on the exponential conversion circuit of Figure 11. Instead, claim 7 is read on Figure 4. Thus, nowhere in the specification disclose or suggest that the exponential conversion circuit of Figure 4 is used in a variable amplifier circuit that includes a plurality of variable amplifiers connected in series (for claim 12). Clarification and/or appropriate correction is required.

***Claim Objections***

4. Claim 12 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the

claim(s) in independent form. Note that claim 12 fails to further limit the subject matter or structural of the exponential conversion circuit of claim 7.

5. Claims 7-12 are objected to because of the following informalities:

In claim 7, line 11, "fourth output" should be changed to --fourth differential output-- for consistency (see lines 14 and 16).

In claim 7, line 20, "sixth output" should be changed to --sixth differential output-- for consistency (see line 23).

In claim 7, line 28 and 31, it appears that "ninth differential output" should be changed to --a ninth output-- because the fourth voltage conversion circuit (i.e., circuit 1E in Figure 4) generates only one output, not differential outputs.

Claims 8-12 are object to because they include the informalities of claim 7.

Also in claim 8, line 3, "circuit, respectively." should be changed to --circuit--.

Also in claim 10, line 2, "comprise, respectively, electric field effect" should be changed to --comprise field effect--.

Also in claim 11, line 2, "comprise, respectively," should be changed to --comprise--.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 7-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to claim 7, the recitation “the third and fourth voltages” on line 11 lacks antecedent basis because there are no such third and fourth voltages recited earlier in the claim. It is suggested that “the” in the above phrase should be deleted.

Also, in claim 7, “the second gain control signal” on lines 11-12 lacks antecedent basis because there is no such a second gain control signal recited earlier in the claim. It is suggested that “the” in the above phrase should be changed to --a--.

Also, in claim 7, “the third gain control signal” on lines 20-21 lacks antecedent basis because there is no such a third gain control signal recited earlier in the claim. It is suggested that “the” in the above phrase should be changed to --a--.

Also in claim 7, the recitation “the seventh and eighth differential output voltages” on line 25 lacks antecedent basis because there are no such seventh and eighth differential output voltages recited earlier in the claim. It is suggested that “the” in the above phrase should be deleted.

Also in claim 7, the recitation “to change the fifth output current linearly and exponentially with respect to the control input voltage” on lines 33-34 is indefinite because it is not clear how the fifth output current can be changed linearly and exponentially at the same time. Note that the specification discloses on line 16-18 of page 21 that the output current  $I_{out}$  (i.e., the fifth output current in the claim) only changes exponentially. Thus, it appears that “linearly and” on line 33 of the claim should be deleted. Clarification and/or appropriate correction is requested.

Claims 8-12 are indefinite because they include the indefiniteness of claim 7.

Also in claim 12, “a gain is controlled” on line 3 is indefinite because it is not clear which element is “a gain” refers to, i.e., a gain of the variable amplifier circuit or a gain of each of the plurality of variable gain amplifiers. Clarification and/or appropriate corrections requested.

***Allowable Subject Matter***

8. Claims 7-12 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, and the minor informalities set forth in this Office action.

Claim 7 would be allowed because the prior art fails to disclose or suggest an exponential circuit which includes first to fifth voltage conversion circuits, first to fifth exponential conversion devices, a voltage conversion circuit, and first and second current comparison circuits with the recited connections and operations set forth therein.

Claims 8-12 include the allowable subject matter of claim 7, so claims 8-12 would also be allowed.

***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directly to Examiner Long Nguyen whose telephone number is (571) 272-1753. The Examiner can normally be reached on Monday to Friday from 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Callahan, can be reached at (571) 272-1740. The fax number for this group is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

November 12, 2004



Long Nguyen  
Primary Examiner  
Art Unit: 2816